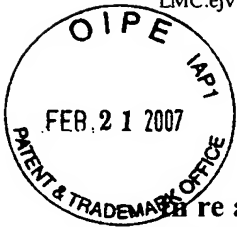


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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

John L. Klocke and Linlin Chen

Application No. 10/688,420

Filed: October 16, 2003

Confirmation No. 2239

For: ELECTROPLATING COMPOSITIONS
AND METHODS FOR
ELECTROPLATING

Examiner: Edna Wong

Art Unit: 1753

Attorney Reference No. 6884-65576-01

CERTIFICATE OF MAILING

I hereby certify that this paper and the documents referred to as being attached or enclosed herewith are being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: MAIL STOP APPEAL BRIEF - PATENTS, COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450 on the date shown below.

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TRANSMITTAL LETTER

Enclosed for filing in the application referenced above are the following:

- ☒ Reply Brief
- ☒ The Director is hereby authorized to charge any additional fees that may be required, or credit over-payment, to Deposit Account No. 02-4550. A copy of this sheet is enclosed.
- ☒ Please return the enclosed postcard to confirm that the items listed above have been received.

Respectfully submitted,

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By

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PATENT



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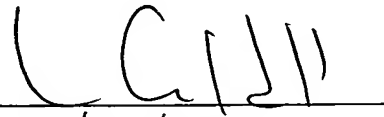
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REPLY BRIEF

This Reply Brief is being filed in accordance with 37 C.F.R. § 41.41. This Reply Brief is responding to a single new ground of rejection in the Examiner's Answer and is considered to supplement the existing Appeal Brief filed by the Applicants on November 20, 2006. All previous arguments presented in the Applicants' Appeal Brief continue to be applicable and asserted in this Appeal.

If a fee is due, the Commissioner is hereby authorized to charge any deficiency in the required fee or to credit any overpayment to Deposit Account No. 02-4550.

I. Status of Claims

Claims 1-69 are rejected.

The rejections of claims 1-69 are appealed.

II. New Ground of Rejection also to be Reviewed on Appeal

The following new ground of rejection was presented in the Examiner's Answer (Mail Date December 18, 2006). This appears to be a new ground of rejection because it was not presented as a ground of rejection in the Final Office Action (Mail Date June 8, 2006) from which rejections the present Appeal is made. This rejection had been presented by the Examiner in the Office Action mailed prior to the Final Office Action. Thus, this is a new ground of rejection as far as it was not presented in the Final Office Action and accordingly, under the "new" Appeal rules Applicants are required to file a Reply Brief to continue the Appeal and avoid *sua sponte* dismissal.

New Ground of Rejection

Whether claims 63-65 are obvious under 35 USC § 103(a) in view of Grandikota (US Patent App. No. 2002/0112964) in combination with Gabe (US Patent App. No. 2003/0066756).

III. Argument to the New Ground of Rejection

1. Rejection of claims 63-65 under § 103(a) in view of Grandikota (US Patent App. No. 2002/0112964) in combination with Gabe (US Patent App. No. 2003/0066756)

Claims 63-65

Claim 63 recites in part, a method for plating a workpiece utilizing an electroplating composition comprising about 35 to about 60 g/L copper and about 65 to about 150 g/L sulfuric acid. Claims 64 and 65 depend from claim 63 and further recite specific ratio ranges of copper to acid (about 0.4 to 0.8 and about 0.3 to 0.8, respectively). Applicants request that the rejections be reversed.

Note: This is a new ground of rejection because it was not presented as a ground of rejection in the Final Office Action (Mail Date June 8, 2006) from which rejections the present Appeal is made. This rejection had been presented by the Examiner in the Office Action (Mail Date March 8, 2006) mailed prior to the Final Office Action. As such, this appears to be a new ground of rejection as far it was not presented in the Final Office Action and accordingly, under the “new” Appeal rules Applicants are required to file a Reply Brief to continue the Appeal and avoid *sua sponte* dismissal.

Grandikota Only Discloses Acid Ranges Outside Applicants' Claimed Range and the Specific Acid and the Copper Composition in Grandikota Cited by the Examiner is Far Below the Claimed Acid Range

Nothing in Grandikota teaches or suggests the claimed composition of about 35 to about 60 g/L copper and about 65 to about 150 g/L sulfuric acid. Grandikota teaches that a relatively high copper concentration of 30-55 g/L copper as compared to Grandikota's required low acid concentration 4-10 g/L (as recited in the Grandikota specification [0016, lines 7-8] and as cited in the Examiner's Answer, p. 46, XXV(b)(ii) and as recited in a claim 4-60 g/L (Grandikota claim 1 as cited by the Examiner). In other words, in Grandikota the copper concentration is relatively high as compared to the required low acid concentration. Further, Grandikota discloses an acid range below the acid range recited in the present claims. This reference neither

teaches nor suggests the acid range claimed in any of the presently considered claims of the current application. Indeed, the Grandikota reference substantiates all the comments made above regarding the prior art teaching either a relatively high copper to a low acid concentration or a low copper to a relatively high acid concentration but never teaches or suggests the relative recited ranges as currently claimed. As mentioned, the only concentration taught in the Grandikota specification – which is cited by the examiner (i.e., [0016] especially lines 7-8) - teaches an acid concentration of only 4-10 g/L -- far below the presently claimed 65-150 g/L sulfuric acid.

In addition, Grandikota stresses that low acid concentrations and relatively high copper concentrations need to be used for uniform depositions. In paragraph [0018] at lines 4-7, Grandikota states that "an electroplating solution having high copper concentration, i.e., greater than 0.4 M, is beneficial to overcome mass transport limitations that are encountered when plating small features." Grandikota then states (at [0018] lines 12-16) that a high copper concentration enhances diffusion and reduces mass transport limitations. Following statements about high copper concentrations, Grandikota states, "A lower acid concentration permits the use of a higher metal ion [concentration] . . ." (at [0018], lines 19-22). Grandikota further states (at [0019], lines 1-4 and 16-17), "a high sulfuric acid concentration may be detrimental to uniform plating because the resistive substrate effects may be amplified by a highly conductive plating solution. . . . Therefore, the electroplating solution includes an acid at a concentration of between about 4 gm/L and about 60 gm/L."

Clearly Grandikota teaches use of a low acid concentration, i.e., between 4 and 10 g/L as taught in the specification and between 4 and 60 g/L as claimed - which range is below Applicants' claimed range of about 65 to about 150 g/L. Further, Grandikota teaches that lower acid not higher acid concentrations are necessary for uniform plating. This further argues against any finding that Grandikota makes the higher acid concentration as claimed obvious. That is, Grandikota's disclosed low acid concentration range does not overlap with Applicants' high acid concentration range claimed and Grandikota asserts that higher acid concentrations are to be avoided.

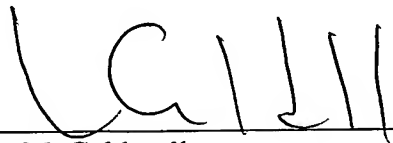
The other cited references do not make up for the deficiencies of Grandikota, nor does the Examiner assert that they do. Clearly the Grandikota reference neither teaches nor suggests the

presently claimed compositions or methods recited in claims 63-65. Applicants request that the rejections be reversed.

Respectfully submitted,

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